

*Response to Office Action Dated 12/13/2004
U.S. Ser. No. 10/605,027*

REMARKS

By this amendment, claims 1, 23 and 24 have been amended, claim 41 canceled, and claims 1-40 are pending. Claims 10-20 and 25-37 stand rejected as anticipated by Fiocco et al. '537; claims 21-22 stand rejected as obvious over Fiocco et al. '537 in view of Fiocco '563; claims 1-9, 23, 24, and 41 were withdrawn from examination due to a restriction requirement; and claims 38-40 were indicated as allowable, but objected to as depending from a rejected base claim. Further examination of the application, as amended, withdrawal of the restriction requirement, and reconsideration of the rejections are respectfully requested.

Restriction Requirement

The office action placed a restriction requirement on the application as drawn to three distinct inventions: (I) claims 1-9, 23, and 24 as drawn to an extraction vessel with an exterior manway and manway hatches; (II) claims 10-22 and 25-40 as drawn to a method and apparatus for liquid-liquid extraction; and (III) claim 41 as drawn to retrofitting an existing rotating disc contactor. Applicant hereby confirms the provisional election of the claims to invention II, with traverse.

Claim 41 is canceled without prejudice to its presentation in a continuing or divisional application.

Claims 23 and 24, as originally drawn to a method, depended from apparatus claim 1 due to a typographical error corrected by the present amendment. Claims 23 and 24 should properly be under elected group II. Withdrawal of the restriction requirement and rejoinder of claims 23 and 24 are respectfully requested.

Claim 1 has been amended so that claims 1-9 depend from claim 26, and the restriction requirement is thus traversed. Claims 1-9 are believed to be allowable as depending from an allowable base claim, and are thus subject to rejoinder since no additional searching or undue burden is imposed on the examiner. For example, claim 1 recites the manway hatch feature the examiner has indicated in claim 40 obtains allowable subject matter, claim 6 the removable blanking strips of allowable claim 38,

*Response to Office Action Dated 12/13/2004
U.S. Ser. No. 10/605,027*

and claim 7 the adjustable blanking strips of allowable claim 39. Upon an indication of allowability of claim 26, rejoinder of claims 1-9 is respectfully requested.

Rejections under 35 U.S.C 102(b)

By way of background, the present invention provides a method and apparatus for contacting two liquid phases for liquid-liquid extraction in a vertical extraction vessel. A relatively heavier liquid phase, descending the extraction vessel at a relatively low volumetric flow rate, is dispersed into a continuous phase comprising a relatively lighter liquid rising through the extraction vessel at a relatively high flow rate. Sieve trays within the vessel generate droplets of the heavy liquid and disperse the heavy liquid droplets into the continuous, relatively lighter ascending liquid phase. The sieve trays can be provided with adjustable active areas and overlapping manways for personnel access.

Fiocco et al. '537 discloses a countercurrent liquid-liquid extraction apparatus in which the perforate plate of the cascaded weirs disperses the relatively light phase into a plurality of droplets which pass upwardly and coalesce (col. 4, lines 15 – 23; col. 6, lines 35 – 39). The heavy, continuous phase flows in a downward cross flow (col. 6, lines 50 – 60). The trays of Fiocco et al. '537 are designed to disperse the light phase into droplets and allow the cross flow of the heavy, continuous phase. Fiocco et al. '537 is thus in direct contrast to applicant's claimed invention as set forth in claims 10, 25, and 26: applicant's trays are designed to disperse the heavy phase into droplets, and allow the cross flow of the light, continuous phase.

In addition, the examiner has equated vertical means 82 and drain pipes 84 in Fiocco et al. '537 with perforations allowing the downward passage of the heavy phase. The function of drain pipe 84 is not to allow the downward passage of the heavy phase; rather, drain pipe 84 is designed to fill the area between seal pan 60 and perforate plate 70 with the heavy phase so as to force the light phase through perforate plate 70. The heavy phase flow is thus designed to occur between vertical means 82 and the vertical extending sections 41, 51 (col. 4, lines 61 – 66). Thus, Fiocco et al. '537 does not disclose perforations allowing the downward passage of the heavy phase.

*Response to Office Action Dated 12/13/2004
U.S. Ser. No. 10/605,027*

With respect to claim 19, Fiocco et al. '537 discloses a light phase (lube oil) to heavy phase (solvent) ratio of 1:4 (col. 10, line 8) and 1:2.65 (col. 10, line 48). In contrast, applicant claims a light phase to heavy phase ratio range from 1.5:1 to 15:1. Thus, applicant does not claim the same range disclosed by Fiocco et al. '537. The relatively high ratio of light phase flow to heavy phase flow and the dispersion of the light phase droplets into the heavy phase crossflow represents a novel paradigm shift in liquid-liquid extraction apparatus and methodology compared to the prior art.

Fiocco et al. '537 does not disclose each and every element as set forth at least in claims 10, 19, 25, and 26, thus Fiocco et al. '537 does not anticipate applicant's claimed invention (MPEP 2131). The 102 rejection of claims 10-20 and 25-37 is improper and should be withdrawn.

Rejection under 35 U.S.C. 103(a)

Referring to claims 21 and 22, a rejection under 35 U.S.C. §103(a) is not proper as each element of the rejected claim does not appear within the proposed combination of Fiocco et al. '537 and Fiocco '563. As mentioned above, the structure of Fiocco et al. '537 does not perform the same function as the trays in applicant's claimed method. Applicant finds no mention of "propane" in Fiocco '563, however, irrespective of solvent choice or solvent feed location, the trays or the function of the trays of Fiocco et al. '537 would not be equivalent to the trays as claimed by applicant. As a result, the proposed combination of Fiocco et al. '537 and Fiocco '563 does not teach or suggest all of the elements of claims 21 or 22, and a rejection under 35 U.S.C. § 103(a) is not proper.

It has been shown by the arguments above that Fiocco et al. '537 does not anticipate the present invention and does not teach each element contained in independent claims 10, 19, 25, and 26. Each of the independent claims has therefore been shown to be novel. Fiocco '563 does not teach or suggest any of the missing elements, nor any motivation for providing them, and thus fails to bridge the gap to applicant's invention. As such, a prima facie case of obviousness can not be established, and the rejection of claims 21 and 22 under 35 U.S.C. 103(a) was improper. The suggested combination of

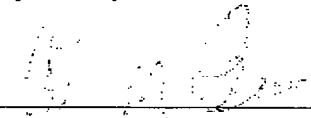
*Response to Office Action Dated 12/13/2004
U.S. Ser. No. 10/605,027*

references does not teach all the claim limitations, and no suggestion or impetus to combine the references can be found in the references relied upon.

During the course of these remarks, Applicant has at times referred to particular limitations of the claims that are not shown in the applied prior art. This short-handed approach to discussing the claims should not be construed to mean that the other claimed limitations are not part of the claimed invention. Consequently, when interpreting the claims, each of the claims should be construed as a whole, and patentability determined in light of this required claim construction. Unless Applicant has specifically stated that an amendment was made to distinguish the prior art, it was the intent of the amendment to further clarify and better define the claimed invention.

If the Examiner has any questions or comments regarding this communication, the Examiner is invited to contact the undersigned directly to expedite the resolution of this application. Further examination of the application and reconsideration of the claims and specification as amended and the allowance thereof is respectfully requested.

Respectfully submitted,



Daniel N. Lundeen
Reg. No. 31,177
Lundeen & Dickinson, L.L.P.
P.O. Box 131144
Houston, Texas 77219-1144
(713) 652-2555
(713) 652-2556 Fax
Attorney for Applicant